Table of Contents

Proceedings Summary 74th Annual Meeting vi

Annual Report—AFS Executive Vice-President xii

Annual Report—AFS Vice-President-Finance xvi

Annual Report—AFS Vice-President-Technology xvii

Minutes—AFS Board of Directors 1st Meeting xx

Minutes—AFS Board of Directors 2d Meeting xxii

Minutes—AFS Technical Council Meeting xxvii

Minutes—AFS Technical Council Meeting xxx

Minutes—AFS-T&RI Trustees Meeting xxxii

Minutes—AFS-T&RI Trustees Meeting xxxiv

Minutes—AFS Board of Directors 3d Meeting xxxvi

Minutes—AFS Board of Directors Final Meeting xxxxi

Program—27th Annual Chapter Officers Conference .. xxxxiii

Evaluation of Mechanical Property Tests for High Density Molding, Green Sand Molding Committee 80-D 1

Detrimental Effect of Calcium on the Graphite Structure in Heavy Section Ductile Iron, N. L. Church, R. D. Schelleng 5

Some Studies on the Manufacture of Cast Stainless Steel 13 Chrome Francis Type Runners for Hydraulic Turbines, M. Kohno, M. Makioka 9

A New Control Tool: A Graph for Evaluating Effectiveness of Available Bentonite Within Foundry System Sands, C. E. Wenninger, A. P. Volkmar 17

Thermal Analysis of Copper Alloys, D. Arnaud 25

Status of the Flowability Test for Core Sand Mixtures, E. G. Gentry, B. Jones, S. A. Yount 33

The Development of Radiographic Standards for Aluminum Alloy Die Castings, W. H. Baer 37

Water-clay Entities on Grain Surfaces as Defined by a Scanning-type Electron Microscope, C. E. Wenninger, R. A. Green 40

Continuous Induction Iron Melting—A Process Report on the Operation of an Experimental Unit, R. S. Amala, J. B. Walker, W. Newsted, W. J. Duca 45

Tests of Activation of Clays and the Effect of Activation on Casting Quality, A. E. Murton 48

Polystyrene Patterns for Machine Tool Castings, R. G. Chamberlain 53

Bonding Clay Technology-Current Concepts, C. A. Sanders, R. L. Doelman 57

Management Looks at In-Plant Environment, C. F. Seelbach, Jr. 73

As-Cast Structures, Defects and Graphitization Kinetics in Ductile Cast Iron Pipes, K. M. Htun 77

Control of Graphite Structure in Heavy Section Ductile Iron Castings, S. I. Karsay, E. Campamanes 85

System Sand Control by Compression vs Compactability Testing, A. P. Volkmar 93

Screen Analysis—What is Practical? Molding & Core Aggregate Committee 80-5 97

Now and Then—The Direct Casting of Iron, W. C. Jeffery 101

Use of an Electron Microprobe in Study of Metal Penetration, Mold-Metal Interface Reactions Committee 80-F, M. J. Granlund 109

Desulfurizing of Molten Iron Droplets While Floating on Slag Baths, W. N. Bargeron, P. K. Trojan, R. A. Flinn 117

Investigation of Mechanism of Dross Formation in Ductile Iron, D. R. Askeland, P. K. Trojan, R. A. Flinn 125

The Structural, Mechanical and Corrosion Resistance Properties of Cobalt-Bearing Aluminum Bronzes, M. Leoni, G. Fortin, L. McD. Schetky 133

Mold Atmosphere Control Review of Causes of "Oxide" Penetration on Ferrous Castings, H. W. Dietert, R. L. Doelman, R. W. Bennett 145

Cold Box Process-Performance of Improved Binder Systems, J. Robins, L. I. Toriello 157

In-Plant Evaluations of Some Modern Tests for Sand Control, Ad Hoc Malleable Sand Systems Control Committee 6-F 161

Development of a Chromium-Silicon Hardened Cast Copper-Nickel, F. J. Ansuini, F. A. Badia 165

Graphite Nodule Control in Malleable Irons, P. B. Burgess, R. G. Trimberger 169

Stress-Strain Relationships for Standard Grades of Gray and Ductile Irons in Tension, Compression and Torsion, J. L. Herron, P. K. Trojan, R. A. Flinn 173

Effect of Low-Frequency Vibration of Solidification, Structure and Mechanical Properties of Al-Cu Alloys, S. Sankaran, K. S. Sreenivasa, Murphy 180

The Fe-C Transformation Diagram Related to Solidification of Cast Irons, R. W. Heine 187

Growth of Malleable Iron Castings During Annealing, A. S. Johnson, C. Nohr 194

A New Methylene Blue Procedure for Determination of Clay in System Sands, H. W. Dietert, A. L. Graham, J. S. Schumacher 208

Sand Control of Green System Sands by a Simple, Inventory Method, G. J. Vingas 213

Evaluation of the Castability of Cu-Ni-Si-Be Alloys, D. R. Askeland, P. K. Trojan, M. L. Foster, R. A. Flinn..... 220

Minor Elements in Gray Iron, R. L. Naro, J. F. Wallace.. 229

Control of Structure and Properties of Irons Cast in Permanent Molds—Part 2, R. R. Skrocki, J. F. Wallace... 239

Sand Control by Independent Variables, D. R. Phillips.. 251

Cold Box Process-Characteristics of a Bonded Sand by Scanning Electron Microscopy, R. H. Toeniskoetter.. 259

Mold Aggregate and Casting Design Interactions Causing Defects in White Iron Castings, P. H. Mikkola, R. W. Heine 265

Computer Oriented Control Concepts for Foundry Process Control Applications, L. A. Nolen 269

Effects of Temperature and Humidity on Phenolic-Resin-Coated Sand, L. O'Donnell 273

Quantitative Gas Testing for Production Control of Aluminum Casting Soundness, J. C. Church, K. L. Herrick 277

Some Advances in the Science of Cast Iron Solidification, J. C. Margerie 281

German Foundry Experience in Cupola Dust Emission and Emission Control, G. Engels 287

Application of the AFS Gray Iron Gating Technique to Stainless Steel Castings, W. L. Hallerberg 293

Use of Computers in New Foundry Planning, C. F. Knight 297

Sulfite Liquor in Molding Sand Helps Avoid Surface Defects on Malleable Iron Castings, H. Kowalke, H. J. Heine 303

A Method for the Measurement of Vapor Pressure in Liquid Alloys and its Application to Co-Zn-X Alloys, L. E. Fernandez, Y. P. Musalem, F. J. Fava, R. A. Flinn 308

Pattern Design for High Pressure Molding, W. A. Blower 313

Physical Explosions in Handling Molten Slags and Metals, J. M. Genco, A. W. Lemon, Jr. 317

Effect of Vibration on Solidification of Transparent Liquids and Al-Si Alloys, A. Claro, J. Conrads, J. Fava, R. A. Flinn 324

Applications of Knife and Kiss Gating, D. G. Schmidt, A. E. Jacobsen, Jr. 332

A Study of Decarburization Accompanying the Castings of Steel in Ceramic Molds, G. F. Doremus, C. R. Loper, Jr. 338

Factors Influencing the Effectiveness of Late Inoculants, C. K. Tuggle, D. H. Good, R. Carlson 343

Casting Impregnation Techniques and Materials, G. J. Caudron 350

Phase Transformational Behavior and Mechanical Properties of Medium-Carbon Ni-Cr-Mo and Ni-Cr-Si-Mo-V Cast Steels, W. W. Cias 357

Relationship of Gray Iron Macro- and Micro-structure to Cooling Curves, L. E. Menawati, R. W. Heine, C. R. Loper, Jr. 363

Is Thermal Transpiration a Foundry Problem?, D. C. Williams 374

Evaluation of Ductile Iron in Terms of Maximum Feasible Properties of the Material, W. Siefer, K. Orths 382

Unidirectional Solidification, M. C. Flemings, R. Mehrabian 388

Thermal Aspects of Metallic Molds, M. N. Srinivasan, M. R. Seshadri, A. Ramachandran 395

Effect of Sulfur on Nitrogen Content of Liquid Cast Irons, R. D. Pehlke, O. Opravil, P. B. Burgess 401

Cold Box Process—Research to Reality, A. Dorfmueller, R. J. Schafer 404

Heat Conductivity of Molding Sand and Quality of Castings, H. G. Levelink, H. Van den Berg 410

Effect of Section Size on the Mechanical Properties of Cu Alloy Castings, C. R. Loper, Jr., P. D. Bhawalkar, M. L. Hepler 417

Effects of Solidification Conditions on Mechanical Behavior of Al Cast Alloys, J. T. Berry 421

Solidification of Heavy Section Ductile Iron Castings, P. K. Basultkar, C. R. Loper, Jr., C. L. Babu 429

Effects of Variations in Mn and S Contents and Mn:S Ratio on Graphite Nodule Structure and Annealability of Malleable-Base Iron, E. M. Stein, K. R. Grube, A. R. Elsea 435

Influence of Chemical Composition and Heat Treatment on Properties of KO-1 Alloy, F. R. Mollard 443

The Nature of Measurement of Cupola Effluent, M. M. S. Chi, F. Ekman 450

A Fundamental Study of Hot Tearing, S. A. Metz, M. C. Flemings 453

Charging Production Cupola With Vibrating Feeder Reduces Cost of Air Pollution Control Equipment, M. R. Jacoby 461

Discussions 464

Authors Index 472

Subject Index 475

Authors Index

A

Ansuini, F. J., Badia, F. A., Development of a Chromium-Silicon Hardened Cast Copper-Nickel 165
Arnaud, D., Thermal Analysis of Copper Alloys 25
Askeland, D. R., Flinn, R. A., Foster, M. L., Trojan, P. K., Evaluation of the Castibility of Cu-Ni-Si-Be Alloys..... 220
Askeland, D. R., Flinn, R. A., Trojan, P. K., Investigation of Mechanism of Dross Formation in Ductile Iron..... 125

B

Babu, C. L., Loper, C. R., Jr., Basultkar, P. K., Solidification of Heavy Section Ductile Iron Castings..... 429
Badia, F. A., Ansuini, F. J., Development of a Chromium-Silicon Hardened Cast Copper-Nickel 165
Baer, W. H., The Development of Radiographic Standards for Aluminum Alloy Die Castings 37
Bargeron, W. N., Flinn, R. A., Trojan, P. K., Desulfurizing of Molten Iron Droplets While Floating on Slag Baths.. 117
Basultkar, P. K., Loper, C. R. Jr., Babu, C. L., Solidification of Heavy Section Ductile Iron Castings..... 429
Bennett, R. W., Diertert, H. W., Doelman, R. L., Mold Atmosphere Control Review of Causes of "Oxide" Penetration on Ferrous Castings 145
Berg, van den, H., Levelink, H. G., Heat Conductivity of Molding Sand and Quality of Castings..... 410
Berry, J. T., Effects of Solidification Condition on Mechanical Behavior of Al Cast Alloys..... 421
Bhawalker, P. D., Hepler, M. L., Loper, C. R., Jr., Effects of Section Size on the Mechanical Properties of Cu Alloy Castings 417
Blower, W. A., Pattern Design for High Pressure Molding 313
Burgess, P. B., Opravil, O., Pehlke, R. D., Effect of Sulfur on Nitrogen Content of Liquid Cast Irons..... 401
Burgess, P. B., Trimberger, R. G., Graphite Nodule Control in Malleable Irons 169

C

Campamanes, E., Karsay, S. I., Control of Graphite Structure in Heavy Section Ductile Iron Castings 85
Caudron, G. J., Casting Impregnation Techniques and Materials 350
Chamberlain, R. G., Polysteyrene Patterns for Machine Tool Castings 53
Chi, M. M. S., Ekman, F., The Nature of Measurement of Cupola Effluent 450
Church, J. C., Herrick, K. L., Quantitative Gas Testing for Production Control of Aluminum Casting Soundness... 277
Church, N. L., Schelleng, R. D., Detrimental Effect of Calcium on the Graphite Structure in Heavy Section Ductile Iron 5
Cias, W. W., Phase Transformational Behavior and Mechanical Properties of Medium-Carbon Ni-Cr-Mo and Ni-Cr-Si-Mo-V Cast Steels 357
Claro, A., Conrads, J., Fava, J., Flinn, R. A., Effect of Vibration on Solidification of Transparent Liquids and Al-Si Alloys 324
Conrads, J., Claro, A., Fava, J., Flinn, R. A., Effect of Vibration on Solidification of Transparent Liquids and Al-Si Alloys 324

D

Dietert, H. W., Doelman, R. L., Bennett, R. W., Mold Atmosphere Control Review of Causes of "Oxide" Penetration on Ferrous Castings 145
Doelman, R. L., Dietert, H. W., Bennett, R. W., Molt Atmosphere Control Review of Causes of "Oxide" Penetration on Ferrous Castings 145
Doelman, R. L., Sanders, C. A., Bonding Clay Technology —Current Concepts 57
Doremus, G. E., Loper, C. R., Jr., A Study of Decarburization Accompanying the Casting of Steel in Ceramic Molds 338
Dorfmueller, A., Schafer, R. J., Cold Box Process-Research to Reality 404
Duca, W. J., Newsted, W., Walker, J. B., Continuous Induction Iron Melting—A Process Report on the Operation of an Experimental Unit 45

E

Ekman, F., Chi, M. M. S., The Nature of Cupola Effluent.. 450
Elsea, A. R., Stein, E. M., Grube, K. R., Effects of Variations in Mn and S Contents and Mn:S Ratio on Graphite Nodule Structure and Annealability of Malleable-Base Iron 435

Engels, G., German Foundry Experience in Cupola Dust Emission and Emission Control 287

F

Fava, J., Conrads, J., Claro, A., Flinn, R. A., Effect of Vibration on Solidification of Transparent Liquids and Al-Si Alloys 324
Fava, J., Musalem, L. E., Fernandez, L. E., Flinn, R. A., Method for the Measurement of Vapor Pressure in Liquid Alloys and its Application to Cu-Zn-X Alloys.... 308
Fernandez, L. E., Musalem, Y. P., Fava, J., Flinn, R. A., Method for the Measurement of Vapor Pressure in Liquid Alloys and its Application to Cu-Zn-X Alloys.... 308
Flemings, M. C., Mehrabian, R., Unidirectional Solidification 388
Flemings, M. C., Metz, S. A., A Fundamental Study of Hot Tearing 453
Flinn, R. A., Askeland, D. R., Foster, M. L., Trojan, P. K., Evaluation of the Castibility of Cu-Ni-Si-Be Alloys..... 220
Flinn, R A., Askeland, D. R., Trojan, P. K., Investigation of Mechanism of Dross Formation in Ductile Iron..... 125
Flinn, R. A., Bageron, W. N., Trojan, P. K., Desulfurizing of Molten Iron Droplets While Floating on Slag Baths.. 117
Flinn, R. A., Fava, J., Conrads, J., Claro, A., Effect of Vibration on Solidification of Transparent Liquids and Al-Si Alloys 324
Flinn, R. A., Fava, J., Musalem, L. E., Fernandez, L. E., Method for the Measurement of Vapor Pressure in Liquid Alloys and its Application to Cu-Zn-X Alloys.... 308
Flinn, R. A., Herron, J. L., Trojan, P. K., Stress-Strain Relationships for Standard Grades of Gray and Ductile Irons in Tension, Compression and Torsion 173
Fortina, L., Leoni, M., McD Schetky, Structural, Mechanical and Corrosion Resistance Properties of Cobalt-Bearing Aluminum Bronzes 133
Foster, M. L., Flinn, R. A., Askeland, D. R., Trojan, P. K., Evaluation of the Castibility of Cu-Ni-Si-Be Alloys..... 220

G

Genco, J M., Lemon, A. W., Jr., Physical Explosions in Handling Molten Slags and Metals 317
Gentry, E. G., Jones, B., Yount, S. A., Status of the Flowability Test for Core Sand Mixtures 33
Good, D. H., Tuggle, C. K., Carlson, R., Factors Influencing the Effectiveness of Late Inoculants 343
Graham, A. L., Schumacher, J. S., A New Methylene Blue Procedure for Determination of Clay in System Sands 208
Granlund, M. J., Use of an Electron Microscope in Study of Metal Penetration 109
Green, R. A., Wenninger, C. E., Water-Clay Entities on Grain Surfaces as Defined by a Scanning Type Electron Microscope 40
Grube, K. R., Elsea, A. R., Stein, E. M., Effects of Variations in Mn and S Contents and Mn:S Ratio on Graphite Nodule Structure and Annealability of Malleable-Base Iron 435

H

Hallerberg W. L., Application of the AFS Gray Iron Gating Technique to Stainless Steel Castings 293
Heine, H. J., Kowalke, H., Sulfite Liquor in Molding Sand Helps Avoid Surface Defects on Malleable Iron Castings 303
Heine, R. W., The Fe-C Transformation Diagram Related to Solidification of Cast Irons 187
Heine, R. W., Menawati, L. E., Loper, C. R., Jr., Relationship of Gray Iron Macro and Microstructure to Cooling Curves 363
Heine, R. W., Mikkola, P. H., Mold Aggregate and Casting Design Interactions Causing Defects in White Iron Castings 265
Hepler, M. L., Bhawalker, P. D., Loper, C. R., Jr., Effects of Section Size on the Mechanical Properties of Cu Alloy Castings 417
Herrick, K. L., Church, J. C., Quantitative Gas Testing for Production Control of Aluminum Casting Soundness... 277
Herron, J. L., Flinn, R. A., Trojan, P. K., Stress-Strain Relationships for Standard Grades of Gray and Ductile Irons in Tension, Compression and Torsion 173
Htun, K. M., As-Cast Structures, Defects and Graphitization Kinetics in Ductile Cast Iron 77

J

Jacobsen, A. E., Jr., Schmidt, D. G., Applications of Knife and Kiss Gating 332
Jacoby, M. R., Charging Production Cupola With Vibrating Feeder Reduces Cost of Air Pollution Control Equipment 461
Jeffery, W. C., Now and Then—The Direct Casting of Iron 101
Johnson, A. S., Nohr, C., Growth of Malleable Iron Castings During Annealing 194
Jones, B., Gentry, E. G., Yount, S. A., Status of the Flowability Test for Core Sand Mixtures 33

K

Karsay, S. I., Campamanes, E., Control of Graphite Structure in Heavy Section Ductile Iron Castings 85
Knight, C. F., Use of Computers in New Foundry Planning 297
Kohno, M., Makioka, M., Studies on the Manufacture of Cast Stainless Steel (13 Chrome) Francis Type Runners for Hydraulic Turbines 9
Kowalke, H., Heine, H. J., Sulfite Liquor in Molding Sands Helps Avoid Surface Defects on Malleable Iron Castings 303

L

Lemon, A. W., Genco, J. M., Physical Explosions in Handling Molten Slags and Metals 317
Leoni, M., Fortina, L., McD Schetky, Structural, Mechanical and Corrosion Resistance Properties of Cobalt-Bearing Aluminum Bronzes 133
Levelink, H. G., Berg, van den, H., Heat Conductivity of Molding Sand and Quality of Castings 410
Loper, C. R., Jr., Basultkar, P. K., Babu, C. L., Solidification of Heavy Section Ductile Iron Castings 429
Loper, C. R., Jr., Bhawalker, P. D., Hepler, M. L., Effect of Section Size on the Mechanical Properties of Cu Alloy Castings 417
Loper, C. R., Jr., Doremus, G. E., A Study of Carburization Accompanying the Casting of Steel in Ceramic Molds 338
Loper, C. R., Jr., Heine, R. W., Menawati, L. E., Relationship of Gray Iron Macro and Microstructure to Cooling Curves 363

M

Makioka, M., Kohno, M., Studies on the Manufacture of Cast Stainless Steel (13 Chrome) Francis Type Runners for Hydraulic Turbines 9
Margerie, J. C., Some Advances in the Science of Cast Iron Solidification 281

McD Schetky, Fortina, L., Leoni, M., Structural, Mechanical and Corrosion Resistance Properties of Cobalt-Bearing Aluminum Bronzes 133
Mehrabian, R., Flemings, M. C., Unidirectional Solidification 388
Menawati, L. E., Heine, R. W., Loper, C. R., Jr., Relationship of Gray Iron Macro and Microstructure to Cooling Curves 363
Metz, S. A., Flemings, M. C., A Fundamental Study of Hot Tearing 453
Mikkola, P. H., Heine, R. W., Mold Aggregate and Casting Design Interactions Causing Defects in White Iron Castings 265
Mollard, F. R., Influence of Chemical Composition and Heat Treatment on Properties of KO-1 Alloy..... 443
Murphy Screenivasa, K. S., Sankaran, S., Effect of Low-Frequency Vibration of Solidification, Structure and Mechanical Properties of Al-Cu Alloys 180
Murton, A. E., Tests of Activation of Clays and the Effect of Activation on Casting Quality 48
Musalem, L. E., Fernandez, L. E., Fava, J., Flinn, R. A., Method for the Measurement of Vapor Pressure in Liquid Alloys and its Application to Cu-Zn-X Alloys.... 308

N

Newsted, W., Duca, W. J., Walker, J. B., Continuous Induction Iron Melting—A Process Report on the Operation of an Experimental Unit 45
Nohr, C., Johnson, A. S., Growth of Malleable Iron Castings During Annealing 194
Naro, R. L., Wallace, J. F., Minor Elements in Gray Iron.. 229
Nolen, L. A., Computer Oriented Control Concepts for Foundry Process Control Applications 269

O

O'Donnell, L., Effects of Temperature and Humidity on Phenolic-Resin-Coated Sand 273
Opravil, O., Pehlke, R. D., Burgess, P. B., Effect of Sulfur on Nitrogen Content of Liquid Cast Irons 401
Orths, K., Siefer, W., Evaluation of Ductile Iron in Terms of Maximum Feasible Properties of the Material..... 382

P

Pehlke, R. D., Opravil, O., Burgess, P. B., Effect of Sulfur on Nitrogen Content of Liquid Cast Irons 401
Phillips, D. R., Sand Control of Independent Variables... 251

R

Ramachandran, A., Seshadri, M. R., Srinivasan, M. N., Thermal Aspects of Metallic Molds 395
Robins, J., Toriello, L. I., Cold Box Process—Performance of Improved Binder Systems 157

S

Sanders, C. A., Doelman, R. L., Bonding Clay Technology —Current Concepts 57
Sankaran, S., Murphy Screenivasa, K. S., Effect of Low-Frequency Vibration of Solidification, Structure and Mechanical Properties of Al-Cu Alloys 180
Schafer, R. J., Dorfmueller, A., Cold Box Process—Research to Reality 404
Schelleng, R. D., Church, N. L., Detrimental Effect of Calcium on the Graphite Structure in Heavy Section Ductile Iron 5
Schmidt, D. G., Jacobsen, A. E., Jr., Applications of Knife and Kiss Gating 332
Schumacher, J. S., Graham, A. L., A New Methylene Blue Procedure for Determination of Clay in System Sands 208
Seelbach, C. F., Jr., Management Takes a Look at In-Plant Environment 73
Seshadri, M. R., Srinivasan, M. N., Ramachandran, A., Thermal Aspects of Metallic Molds 395
Siefer, W., Orths, K., Evaluation of Ductile Iron in Terms of Maximum Feasible Properties of the Material..... 382
Skrocki, R. R., Wallace, J. F., Control of Structure and Properties of Irons Cast in Permanent Molds—Part 2.. 239
Srinivasan, M. N., Seshadri, M. R., Ramachandran, A., Thermal Aspects of Metallic Molds 395
Stein, E. M., Elsea, A. R., Grube, K. R., Effects of Variations in Mn and S Contents and Mn:S Ratio on Graphite Nodule Structure and Annealability of Malleable-Base Iron 435

T

Toeniskoetter, R. H., Cold Box Process—Characteristics of a Bonded Sand by Scanning Electron Microscope... 259
Toriello, L. I., Robins, J., Cold Box Process-Performance of Improved Binder Systems 157
Trimberger, R. G., Burgess, P. B., Graphite Nodule Control in Malleable Irons 169
Trojan, P. K., Askeland, D. R., Flinn, R. A., Investigation of Mechanism of Dross Formation in Ductile Iron..... 125
Trojan, P. K., Bageron, W. N., Flinn, R. A., Desulfurizing of Molten Iron Droplets While Floating on Slag Baths.. 117
Trojan, P. K., Flinn, R. A., Herron, J. L., Stress-Strain Relationships for Standard Grades of Gray and Ductile Irons in Tension, Compression and Torsion 173
Trojan, P. K., Foster, M. L., Flinn, R. A., Askeland, D. R., Evaluation of the Castibility of Cu-Ni-Si-Be Alloys..... 220
Tuggle, C. K., Good, D. H., Carlson, R., Factors Influencing the Effectiveness of Late Inoculants 343

V

Vingas, G. J., Sand Control of Green System Sands by a Simple Inventory Method 213
Volkmar, A. P., System Sand Control by Compression vs Compactability Testing 93
Volkmar, A. P., Wenninger, C. E., A New Control Tool: A Graph for Evaluating Effectiveness of Available Bentonite Within Foundry System Sands 17

W

Walker, J. B., Duca, W. J., Newsted, W., Continuous Induction Iron Melting—A Process Report on the Operation of an Experimental Unit 45
Wallace, J. F., Naro, R. L., Minor Elements in Gray Iron.. 229
Wallace, J. F., Skrocki, R. R., Control of Structure and Properties of Irons Cast in Permanent Molds—Part 2.. 239
Wenninger, C. E., Green, R. A., Water-Clay Entities on Grain Surfaces as Defined by a Scanning Type Electron Microscope 40
Wenninger, C. E., Volkmar, A. P., A New Control Tool: A Graph for Evaluating Effectiveness of Available Bentonite Within Foundry System Sands 17
Williams, D. C., Is Thermal Transpiration a Foundry Problem? 374

Y

Yount, S. A., Gentry, E. G., Jones, B., Status of the Flowability Test for Core Sand Mixtures 33

Subject Index

The page numbers refer to the first page of the entire article which contains the subject listed.

A

Activation of
  Bentonites 57
  Clay and Casting quality 48
Active clay
  Sand testing 161
Aggregates and
  White Iron feeding distance and defects 265
Air gap formation and
  Metallic molds 395
Air pollution
  Cupola control cost reduction 461
  Cupola effluent measurement and nature 450
  Cupola emission control 287
Aluminum
  Die casting radiographic standards 37
  Gas analysis to predict casting soundness 277
  Hot tearing and structure and solidification 453
  Solidification and mechanical properties 421
  Solidification, hot tearing and structure 453
  Structure, hot tearing and solidification 453
Aluminum bronzes cobalt-bearing
  Corrosion resistance 133
  Mechanical properties 133
  Structure 133
Aluminum-Copper alloys
  Mechanical properties 180
  Solidification 180
  Structure 180
  Vibration of 180
Aluminum Ko-I alloy
  Chemical composition & heat treatment effect on mechanical properties 443
  Heat treatment effect & chemical composition on mechanical properties 443
  Mechanical properties and heat treatment, chemical composition effect 443
Aluminum-Silicon alloys
  Solidification studies 324
  Vibration studies 324
Analysis of
  Copper alloys 25
Annealing
  Computer control 269
  Malleable Iron 169
  Malleable Iron and Growth 194
  Malleable iron and manganese & sulfur effect 435

B

Bentonites
  Activation 57
  Exchange capacity 57
  Graph for determining effectiveness 17
  Molecular structure 57
  Properties 57
Burn on
  Ferrous castings 145

C

Cast Iron
  Carbon equivalent effect 281
  Graphite nodule inclusions and solidification 281
  Inoculation effect on solidification . 281
  Nitrogen content and sulfur effect . 401
  Ore reduction direct 101
  Permanent molding and control of structure and properties 239
  Solidification and iron-carbon transformation diagram 187
  Solidification and microsegregation and chill effect 281
  Sulfur effect on nitrogen content . 401
Ceramic molding of
  Steel and decarburization 338
Chemistry and
  Aluminum KO-1 alloy & heat treatment effect on mechanical properties 443
  Sand control 251
Clay
  Activation 57
  Activation and casting quality 48
  Bonding 57
  Exchange capacity 57
  Methylene Blue test for 161
  Methylene Blue new test 208
  Molecular structure 57
  Properties 57
  Sand control 213
Cold box process
  Binder systems 404
  Binder tests 157
  Core blowing 404
  Core bonding 259
  Core characteristics 259
  Core curing 404
  Core defects 259
  Coremaking 404
  Core properties 259
Compactability and
  Sand testing of moisture 161
Computer applications
  Annealing furnace control 269
  Cupola blower control 269
  Foundry planning 297
  Melt rate control 269
  Process control 269
  Mechanical properties & section size effect 417
  Thermal analysis 25
Copper-Nickel alloys
  Chromium-Silicon hardened 165
  Corrosion resistance 165
  Mechanical properties 165
  Weldability 165
Copper-Nickel-Silicon-Beryllium alloys
  Defects, hot tearing 220
  Melting 220
  Metallurgy 220
  Pouring 220
  Risering 220
Cores and
  Cold box process 259
Core blowing and
  Cold box process 404
Core bonding
  Cold box process 259
Coremaking
  Cold box process 404
Core sand
  Flowability test 33
Corrosion resistance of
  Aluminum bronzes cobalt-bearing . 133
  Copper-Nickel alloys 165
Cost reduction
  Air pollution control equipment for the cupola 461
Cupola
  Air pollution control cost reduction 461
  Charging methods for air pollution control cost reduction 461
  Computer application 269
  Emission control 287
  Vibration feeder for cost reduction of air pollution control 461
Cupola effluent
  Measurement and nature 450

Cu-Zn-X and
Vapor pressure measurement 308

D

Decarburization
Steel casting in ceramic molds ... 338
Defects
Aluminum castings and prediction with gas analysis 277
Burn on in ferrous castings 145
Cold box process 259
Copper-Nickel-Silicon-Beryllium alloys and hot tearing 220
Ductile Iron pipe 77
Hot tearing of aluminum alloys ... 453
Hot tearing of Copper-Nickel-Silicon-Beryllium alloys 220
Malleable iron avoided with sulfite liquor in molding sand 303
Molding sand 410
Oxide penetration on ferrous castings 145
Penetration of metal and electron micro-probe 109
Stainless steel casting of Francis type runners for hydraulic turbines 9
White iron and feeding distances . 265
Desulfurization
Floating-drop method 117
Die Casting
Aluminum radiographic standards . 37
Dross formation in
Ductile Iron 125
Ductile Iron
Dross formation 125
Inoculation 343
Late inoculation 343
Mechanical properties at a maximum 382
Stress strain in tension compression and torsion 173
Ductile iron Heavy section
Chill effectiveness 429
Graphite structure and calcium effect 5
Graphite structure and effect of elements 85
Nodule count 429
Solidification 429
Structure 429
Ductile Iron pipe
Defects 77
Graphitization kinetics 77
Structures 77

E

Electron micro-probe and
Penetration of metal 109
Elements effect on
Ductile Iron and Graphite control 85
Malleable iron properties 169
Emission control of
Cupola 287
Environmental control
Environment in plant 73
Exothermic materials and
Unidirectional solidification 388
Explosions with
Slags and metals 317

F

Feeding distance and
White iron defects 265
Floating-drop method of
Desulfurization 117
Flowability Test for
Core sand 33
Foundry planning
Computer applications 297
Furnaces
Induction furnace for continuous iron melting 45

G

Gas Analysis and
Aluminum casting soundness prediction 277
Gases in Metals and
Aluminum casting soundness 277
Gating
Kiss applications 332
Knife applications 332
Steel casting using gray iron technique 293
Graph for
Bentonite effectiveness 17
Graphite nodule of
Malleable iron & Manganese sulfur effect 435
Graphite structure
Ductile Iron and calcium effect ... 5
Ductile Iron and effect of elements 85
Graphitization
Ductile Iron pipe 77
Gray Iron
Cooling curves and structure relationship 363
Stress strain in tension compression and torsion 173
Structure and cooling curve relationship 363
Trace or minor elements 229
Green sand and
Clay control 213
Growth of
Malleable Iron and annealing 194

H

Heat conductivity of
Molding sand 410
Heat treatment of
Aluminum KO-1 alloys and chemical composition effect on mechanical properties 443
Heavy section Ductile Iron and
Calcium effect on graphite structure 5
High density molding
Mechanical property tests 1
Pattern design 313
Hot tearing of
Aluminum alloys, structure and solidification relationship 453
Hydraulic turbine Francis type runners
Casting defects 9

I

Impregnation
Materials 350
Techniques and Washing 350
Induction Furnaces for
Iron continuous melting 45
Inoculation and
Cast Iron solidification 281
Ductile iron 343
Solidification of Cast Iron 281
Iron-Carbon Diagram
Solidification of Cast Iron 187

K

Kiss gating
Applications 332
Knife gating
Applications 332

L

Late inoculation
Ductile iron 343

M

Machine Tools
Patterns for 53
Malleable Iron
Annealing 169
Annealing and growth 194
Defects avoided with Sulfite liquor in molding sand 303
Effect of elements on properties ... 169
Graphite nodule, structure, annealability and manganese & sulfur effect 435
Manganese & sulfur effect on graphite nodule, structure & annealability 435
Manganese & sulfur effect on
Malleable iron 435
Measurement of
Cupola effluent 450
Mechanical properties
Aluminum castings and solidification 421
Aluminum-Copper alloys 180
Aluminum bronzes cobalt-bearing . 133
Aluminum KO-1 alloy and heat treatment and chemical composition effect 443
Cast iron cast in permanent molds 239
Copper alloy castings & section size effect 417
Copper-Nickel alloys 165
Ductile iron and maximum feasible properties 382
Malleable iron and effect of elements 169
Mechanical property tests for
High density molding 1
Melting
Computer control 269
Copper-Nickel-Silicon-Beryllium alloys 220
Metallic molds
Thermal aspects 395
Methylene Blue New test for
Clay in system sands 208
Methylene Blue test for
Clay 161
Minor elements in
Gray Iron 229
Molding sand and
Heat conductivity 410
Mulling and
Sand control 251

N

Nitrogen content of
Cast iron and sulfur effect 401
Nodule count
Ductile iron heavy section 429

O

Ore Reduction and
Cast Iron direct casting 101
Oxide penetration
Ferrous castings 145

P

Patterns for
Machine tools 53
High pressure molding 313
Penetration of metal and
Electron micro-probe study 109

Permanent molding
Cast Iron and control of structure and properties 239
Thermal aspects of metallic molds . 395
Phenolic-Resin coated sand and Temperature and Humidity effects . 273
Pipe
Ductile Iron 77
Polystyrene patterns for Machine tools 53
Pouring
Copper-Nickel-Silicon-Beryllium alloys 220
Process control and Computer application 269

R

Radiographic standards for Aluminum die castings 37
Ram compaction and Sand testing 161
Risering
Copper-Nickel-Silicon-Beryllium alloys 220

S

Sales trends of Sand binders 404
Sand
Clay control 213
Phenolic-Resin coated and temperature and humidity effects 273
Sand compactability and Compression 93
Sand compression and Compactability 93
Sand Binders
Cold box binder tests 157
Cold box process 404
Resin coated sand and temperature and humidity effects 273
Sales trends 404
Sand control and Chemistry 251
Green systems sand 213
Mulling 251
pH 251
Sand molding 251
Variables 251
Sand grain surface and Scanning electron microscope 40
Sand Molding and
Graph for evaluating effectiveness of bentonite 17
High density molding property tests 1
Malleable iron with sulfite liquor in the sand to avoid defects 303
Sand control 251
Sand Mulling and Sand property improvement 93
Sand properties
Compression related to compatability and moisture 93
Sand testing
Active clay–Methylene blue 161
Binder tests for Cold box process .. 157
Clay by new methylene blue test .. 208
Compactability for testing moisture 161
Compression related to compactability and Moisture 93
Core Sand flowability 33
High density molding 1
Ram compaction testing 161
Screen analysis 97
Scanning electron microscope and Sand grain surface study 40
Screen analysis for Sand testing 97
Section size and
Copper alloy castings and mechanical properties 417
Slag and metal Explosions 317
Solidification of
Aluminum castings, mechanical properties 421
Sturcture and hot tearing relationship 453
Aluminum-Copper alloys 180
Aluminum-Silicon alloys and vibration studies 324
Ductile iron heavy section 429
Permanent metallic mold thermal aspects 395
Cast Iron and
Carbon equivalent effect 281
Cast Iron and inclusions in graphite nodules 281
Cast Iron and Inoculation 281
Cast Iron and Iron-Carbon transformation diagram 187
Cast Iron and microsegregation and chill effect 281
Cast Iron and recent advances 281
Solidification, unidirectional
Iron alloys 388
Nickel alloys 388
Stainless steel casting
Defects in Francis type runners for hydraulic turbines 9
Standards
Radiographic for aluminum die castings 37
Steam development in Molding sand 410
Steel casting
Ceramic molds and decarburization 338
Gating technique of gray iron 293
Ni-Cr-Mo 357
Ni-Cr-Si-Mo-V 357
Stress strain in
Ductile iron 173
Gray iron 173
Structure of
Aluminum alloys, hot tearing and solidification relationship 453
Aluminum bronzes cobalt-bearing . 133
Aluminum-Copper alloys 180
Cast iron in Permanent molds 239
Ductile iron heavy section 429
Ductile iron pipe 77
Gray iron 363
Sulfite liquor in
Molding sand for Malleable iron to avoid defects 303
Sulfur effect on
Cast iron nitrogen content 401
Sulfur & Manganese effect on Malleable iron 435

T

Temperature and Humidity on Sand phenolic-Resin coated 273
Testing
Core sand flowability 33
Electron micro-probe study for metal penetration 109
Flowability of Core Sand 33
Mechanical property tests for high density molding 1
Thermal analysis of Copper alloys 25
Thermal transpiration Principles and applications 374
Trace Elements in Gray Iron 229
Transparent liquids Solidification and Vibration studies 324

U

Unidirectional solidification and Exothermic materials 388
Iron alloys 388
Mechanical properties of Iron and Nickel alloy castings 388
Structure of Iron and Nickel alloys 388

V

Vapor pressure measurement Cu-Zn-X applications 308
Vibration
Aluminum-Copper alloys 180
Solidification of Aluminum-Silicon alloys 324

W

Water-Clay entities on grain surface and Scanning electron microscope 40
Weldability of Copper-Nickel alloys 165
White Iron
Aggregates related to defects 265
Defects and causes 265
Feeding distances and defects 265